4th Quarter 1998
Issue No. 13

MMPA Bulletin

Marine Mammal Commission Annual Meeting

The Marine Mammal Commission (MMC) held its 31st annual meeting in Portland, Maine, on November 10-12, 1998. At the meeting, representatives from the National Marine Fisheries Service (NMFS), the U.S. Fish and Wildlife Service (FWS), the fishing industry, conservation groups, and the scientific community reported on marine mammal issues and findings for 1998. This year's meeting opened with detailed discussions of northern right whale status, research, threats and conservation efforts. Other topics addressed included: Gulf of Maine harbor porpoise, New England pinnipeds, North Atlantic humpback whales, sources and effects of anthropogenic sound in the marine environment, stranded marine mammals, whale watching, coastal stocks of bottlenose dolphins, Hawaiian monk seals, sea otters, contaminants, manatees, offshore development, and tuna/dolphin research.

Established under Title II of the MMPA, The MMC is an independent agency under the Executive Branch of the U.S. Government (effective 9/1/82). It consists of three members, who are experts in marine ecology and resource management and have no vested interest in the taking of marine mammals. These individuals are appointed by the President of the United States with advice and approval from the Senate. The President also designates a Chairman of the MMC, while all other members are considered to be Commissioners. There is also a nine-member Committee of Scientific Advisors with expertise in marine ecology and marine mammal issues. The Committee of Scientific Advisors as well as an Executive Director are appointed by the Chairman in consultation with the other Commissioners, the Council on Environmental Quality, the Secretary of the Smithsonian Institution, the Director of the National Science Foundation, and the Chairman of the National Academy of Sciences.

The MMC develops, reviews, and makes recommendations on the actions and policies of any/all federal agencies relative to marine mammal protection, conservation, and research. This independent body provides guidance on domestic marine mammal protection and conservation issues to Congress and the Executive Branch. It also reviews and makes suggestions on the international actions of the United States pursuant to the International Convention for the Regulations of Whaling, the Whaling Convention Act of 1949, the Interim Convention on the Conservation of North Pacific Fur Seals, and the Fur Seal Act of 1996. Federal agencies and/or officials that receive recommendations from the MMC are required to respond back to the MMC within 120 days. If these agencies and/or government officials choose not to adopt them, then they are required to respond to the MMC with a written explanation of why the recommendations were not followed.

The MMC is also required to publish an Annual Report to Congress each year detailing marine mammal policy, conservation, and research activities carried out by NMFS, FWS, and others. The MMC Annual Report to Congress is a matter of public record and describes actions taken and/or recommendations given by the MMC. These Annual Reports help in the dissemination of marine mammal-related information to Congress, federal, state, and local management agencies, conservation groups, the general public, as well as the scientific community and international communities.

For additional information about the MMC or to obtain a copy of the MMC Annual Report to Congress, you can write to the Marine Mammal Commission at: 4340 East-West Highway, Room 905, Bethesda, Maryland 20814.

In This Issue ....

National Marine Fisheries Service, Office of Protected Resources

The IWC Holds its 50th Annual Meeting

The 50th Annual Meeting of the International Whaling Commission (IWC) was held from May 16-20, 1998 in Muscat, Oman. The IWC is the only international body regulating all forms of whaling (see *MMPA Bulletin* issue No. 10, "The IWC and Subsistence Whaling").

Commercial Whaling In 1982, the IWC decided that catch limits for all commercial whaling would be set to zero. At that time, Norway lodged an objection to the ban and has since exercised its right to set national catch limits for its coastal whaling operations for minke whales. As it has in previous years, the IWC passed a resolution in 1998 calling on Norway to halt all whaling activities under its jurisdiction.

Small Type Coastal Whaling As in previous years, the IWC did not adopt Japan's proposal for an interim relief allocation of 50 minke whales to be taken by coastal community-based whaling.

Revised Management Scheme The IWC noted that work on a number of issues, including specification of an inspection and observer system must be finished before it can consider adopting the Revised Management Scheme (RMP). The IWC adopted a resolution that confirmed how anthropogenic removals (*e.g.*, incidental catches, catches under scientific permit, aboriginal subsistence whaling) other than commercial catches should be taken into account when setting catch limits under the RMP.

Irish Proposal for a Global Solution At last year's meeting, Ireland introduced a proposal for discussion intended to encourage resolution between the governments opposed to and in favor of a resumption of commercial whaling. It included: completion and adoption of the RMP; designation of a global sanctuary for whales with limited coastal whaling; prohibition of international trade in whale products; and the ending of lethal scientific research takes. Although little progress toward reaching compromise was made, the IWC agreed to keep this item on the agenda.

Limits for aboriginal subsistence whaling No changes were made to the catch limits for whale stocks subject to aboriginal subsistence whaling made in 1997. The Scientific Committee continued to make progress towards developing new management regimes for aboriginal subsistence whaling; this work has been given high priority by the IWC.

Lethal scientific permit catches Japan again proposed two scientific research programs - one in the Antarctic and one in the western North Pacific. The IWC adopted a resolution calling on the Government of Japan to refrain from issuing these permits.

Southern Ocean Sanctuary The IWC adopted a resolution providing advice to its Scientific Committee on the objectives of the Southern Ocean Sanctuary. These objectives include monitoring depleted populations and undertaking research on the effects of environmental change. The Scientific Committee is currently developing a major cooperative research program with the Southern Ocean Global Ocean Ecosystems Dynamics (GLOBEC) program and Conservation of Antarctic Marine Living Resources (CCAMLR) in the Southern Ocean Sanctuary for the years 2000 and 2001.

Environmental research In 1998, the IWC strengthened its commitment to studying environmental changes and their effects on cetaceans by establishing a new agenda item on environmental concerns. It reiterated its support for two major collaborative research initiatives made by its Scientific Committee with respect to chemical pollutants and baleen whale habitat and prey studies in cooperation with CCAMLR and Southern Ocean GLOBEC. Furthermore, the IWC committed to proposing a consideration next year on the establishment of a major research fund for environmental studies.

Establishment of a new scientific journal The IWC approved the establishment of a major new scientific journal on cetacean research and management, which goes into print in 1999. The IWC hopes that this journal will maintain and improve the high quality of scientific publications published by the IWC.

For more information about the IWC, please contact Catherine Corson at (301) 713-2322. The next IWC Annual Meeting will be held in Grenada in May 1999.

The *MMPA Bulletin* is published quarterly by the Office of Protected Resources, National Marine Fisheries Service, 1315 East-West Highway, Silver Spring, MD 20910, (301) 713-2322. Send comments and/or suggestions to the above address, Attn: *MMPA Bulletin*, or fax them to (301) 713-0376. The Office of Protected Resources web site address is: http://www.nmfs.gov/prot_res.

Office Director: Hilda Diaz-Soltero
Acting Deputy Office Director: P. Michael Payne
Editors: Nicole R. Le Boeuf, Vicki Cornish, and Trevor Spradlin
Featured Artist: Katherine Zecca

Forensic Workshop in California

Wildlife managers are depending more and more on evidence collected from stranded marine mammals to make determinations about whether or not human activities are negatively impacting marine mammal populations. To work toward more consistent and reliable data collection, NMFS has been working with other federal and state wildlife managers as well as experts in marine mammal science and strandings to develop standardized sampling methods.

The NMFS Office of Protected Resources focused on this issue in a training workshop for marine mammal stranding network participants from around the country on September 10-12, 1998, in Sausalito, California. The workshop entitled, "Stranding Response and Investigations: Sampling and Forensics," was hosted by the Marine Mammal Center as a part of the Marine Mammal Health and Stranding Response Program's yearly marine mammal stranding response training series. The Marine Mammal Center was an ideal location for this training workshop because its staff and volunteers respond to the highest number of marine mammal strandings in the United States each year. Additionally, many of those strandings show signs of human interaction, primarily gunshot wounds.

Workshop participants heard presentations from expert marine mammal veterinarians, pathologists, forensic scientists, stranding network personnel and many more. Topics included descriptive pathology, investigation of gunshot wounds and fishery interactions, satellite tagging for post-release monitoring, and others. Hands-on demonstrations included live pinniped handling and medical care provided by members of the Marine Mammal Center staff. Participants were also given the opportunity to examine the skulls of California sea lions that were found with gunshot wounds to their heads.

On behalf of the National Stranding Network, the Office of Protected Resources would like to sincerely thank the Marine Mammal Center's dedicated staff and volunteers for all of their hard work in making this workshop a huge success. **Our hats off to them!**

Editor's note: The majority of marine mammal rehabilitation facilities rely almost entirely on private donations for financial support and volunteers for labor. By sponsoring training workshops, NMFS assists stranding networks in improving their response skills as well as in opening lines of communication between stranding network participants in different parts of the country.

For more information about the Marine Mammal Health and Stranding Response Program, please contact Dr. Teri Rowles at (301) 713-2322.

The Analytic Quality Assurance Program

Within the Marine Mammal Health and Stranding Response Program (MMHSRP), analytical results for chemical contaminants in marine mammals are generated by both the contaminant monitoring (see *MMPA Bulletin* issue No. 12, "The Marine Mammal Contaminants and Biomonitoring Program") and specimen banking components (see *MMPA Bulletin* issue No. 11, "The National Marine Mammal Tissue Bank"). The contaminant monitoring component involves real-time analyses of samples. The majority of these are being collected specifically for real-time analysis and not banking. However, a portion of them are subsamples of banked specimens. The contaminant monitoring component is led by NMFS' Northwest Fisheries Science Center (NWFSC) Environmental Conservation Division.

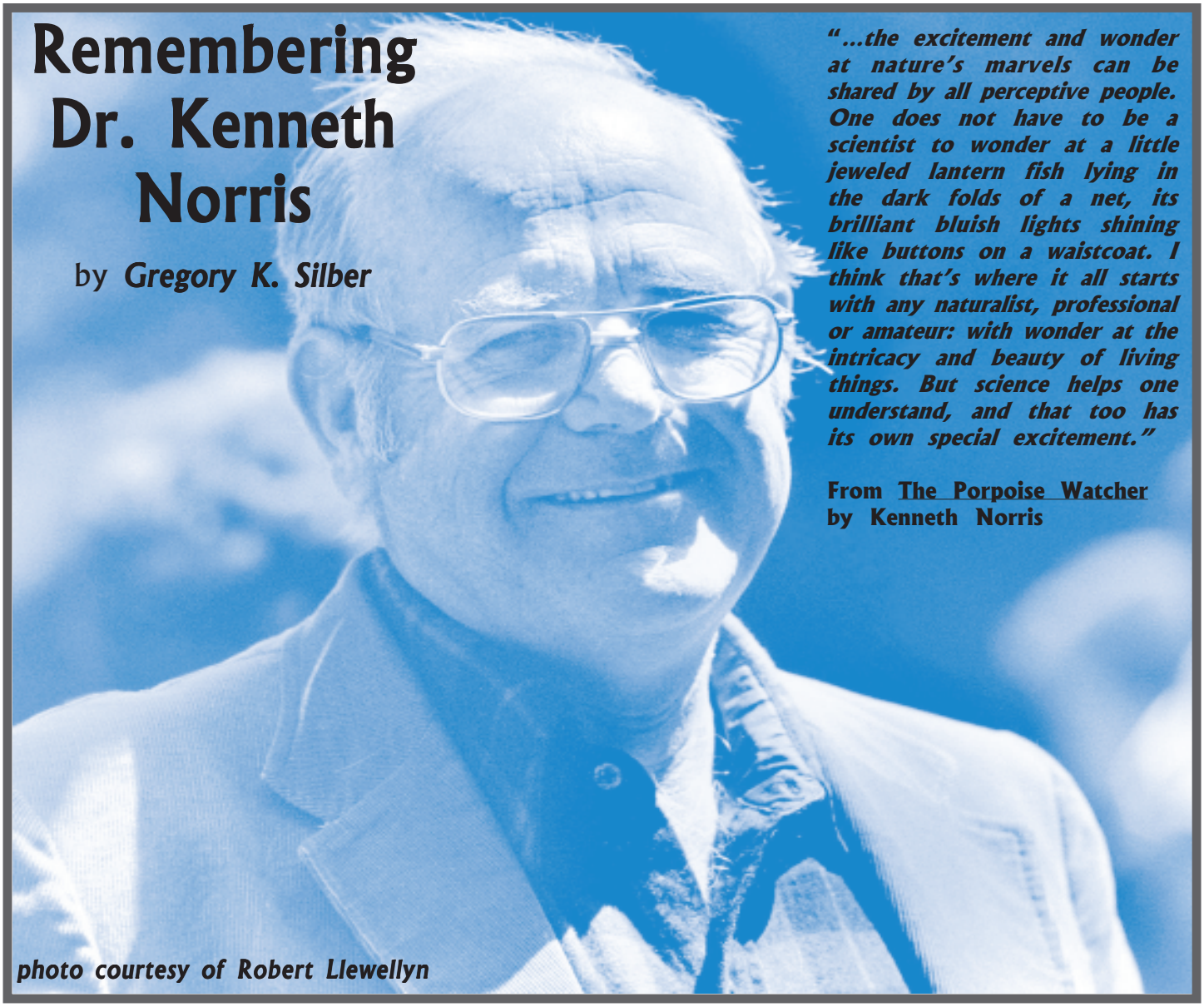
To assess the accuracy and comparability of results among NWFSC, the National Institute of Standards and Technology (NIST), in collaboration with NMFS, administers a quality assurance (QA) program for analytical measurements of contaminants in marine mammal tissues. This QA program consists of: (1) preparation, analysis, and distribution of marine mammal tissue control materials; (2) interlaboratory comparison exercises among laboratories involved in marine mammal tissue analyses; and (3) development of Standard Reference Materials for use in the analysis of marine mammal tissues.

The QA program performs a major function in maintaining the quality of data resulting from the analysis of specimens in the MMHSRP. Scientists requesting specimens from the program's specimen bank for retrospective studies must demonstrate their analytical capabilities through appropriate QA activities, including participation in the NIST-administered QA program. In addition, NMFS requires that all researchers analyzing marine mammal tissues for contaminants under NMFS funding be participants in this program. This requirement ensures that the analytical results from marine mammal monitoring and research programs are of high quality and comparable to those generated in the contaminant monitoring and specimen banking components of the MMHSRP.

For additional information about the analytical QA program or the MMHSRP, please contact Dr. Teri Rowles at (301) 713-2322. NMFS urges those laboratories that currently perform contaminant analyses on marine mammal tissues and are interested in participating in the next interlaboratory comparison to contact Dr. Paul Becker of NIST at (843) 762-8503.

Remembering Dr. Kenneth Norris

by *Gregory K. Silber*



"...the excitement and wonder at nature's marvels can be shared by all perceptive people. One does not have to be a scientist to wonder at a little jeweled lantern fish lying in the dark folds of a net, its brilliant bluish lights shining like buttons on a waistcoat. I think that's where it all starts with any naturalist, professional or amateur: with wonder at the intricacy and beauty of living things. But science helps one understand, and that too has its own special excitement."

From The Porpoise Watcher by Kenneth Norris

photo courtesy of Robert Llewellyn

Renowned naturalist and marine mammal biologist Dr. Kenneth S. Norris died on August 16, 1998 at the age of 74 following heart surgery and complications.

Dr. Norris conducted much of the original study of dolphin echolocation, published over a hundred papers on vertebrate natural history, ecology, and social behavior, and wrote or edited five books on dolphins and whales. Dr. Norris is perhaps best known for his pioneering work on marine mammals, but his research career, which spanned nearly 50 years, included the study of various other taxa and ecological systems. One accomplishment of which he was particularly proud was his role in establishing the University of California's Natural Reserve System, which now consists of 33 university-owned sites and includes over 120,000 acres of protected natural habitat throughout California.

In the 1970s, Dr. Norris was instrumental in studying and calling attention to the large-scale, incidental killing of open ocean dolphins in the tuna fishing industry. His concern and his actions, and those of others, regarding this and other marine mammal issues helped lead to passage of the MMPA in 1972. He had a major role in drafting that legislation, testifying before Congress, and taking other actions to ensure that the MMPA was as effective as possible. The MMPA was landmark legislation that continues to protect marine mammals in all U.S. waters. During this critical period of early marine mammal conservation efforts, Dr. Norris served on the U.S. Marine Mammal Commission's Committee of Scientific Advisors from 1973 to 1976.

Dr. Norris' interest in the natural world dates to his early childhood. Born in Los Angeles in 1924, he explored various southern California ecosystems as a child. I often heard him credit his mother for encouraging his interest in natural things, and apparently she never complained when he brought home such things as snakes and horned lizards and allowed him to keep them in dresser drawers in his bedroom. Much later, but still early in his career, he made significant scientific contributions to the understanding of circadian rhythms in snakes and the function of color change in reptiles and amphibians.

Dr. Norris received B.A. and M.S. degrees from the University of California at Los Angeles and a doctorate degree in zoology from the Scripps Institute of Oceanography. His doctoral research on fishes earned him the Mercer Award for Best Research in American Ecology. In 1953, two years into his doctoral studies, Dr. Norris was hired as the founding curator at Marineland of the Pacific, the country's second oceanarium. Along with collaborator William N. McFarland, Dr. Norris provided the first scientific and taxonomic description of the critically endangered vaquita, or Gulf of California harbor porpoise, in 1958.

His interest in marine life eventually led him to Hawaii, where he served as founding scientific director of the Oceanic Institute from 1968 to 1971. In 1972, he accepted a faculty position at the University of California at Santa Cruz where he also served as director of the Center for Marine Studies (1972-1975), chaired the Environmental Studies Department (1977-1979), founded the Environmental Field Program, and eventually was named professor emeritus.

Dr. Norris is perhaps best known for his research and theories on dolphin sound signals and the ways in which dolphins process sounds. In the mid-1950s, dolphin echolocation -– the ability of dolphins to use high-frequency sounds to sense their environment and locate prey and other organisms — was but a theory. Dr. Norris and his research team were able to confirm the theory by devising a dolphin "blindfold" system. They discovered that dolphin's highly sophisticated ability to process sound could be used for more than discriminating an object's distance and direction, but also to distinguish its size, shape, and texture. Later, Dr. Norris pioneered work on dolphin social signaling and behavior, which included studies of the reasons for dolphin tendency to aggregate in large schools in the open ocean and to coalesce in small groups while near shore.

Dr. Norris had the rare gift of being able to generate both highly regarded scientific papers and popular literature that brought his work to a broader audience. He received the prestigious John Burroughs Medal in 1992 for his book *Dolphin Days: the Life and Times of a Spinner Dolphin*. The introduction to this book opens with,

"In this book I tell two very different stories about a remarkable mammal, the spinner dolphin: one story about its life and societies at sea, and the other about its fate at the hands of man. I have purposefully set one story against the other, because that's the way it has been for me."

Dr. Norris was a skilled storyteller and was quite good at making even the simplest anecdote into a fascinating yarn. Among my favorites and most humorous were those about challenges he faced attempting to study dolphin underwater behavior from an ungainly, homemade, and ill-conceived contraption (later dubbed the Semi-submersible Seasick Machine), which required a researcher to ride in a stuffy metal tank suspended from a towed torpedo-shaped pontoon during operation.

As a teacher, Dr. Norris excited graduate and undergraduate students with his enthusiasm for the study of natural systems, his engaging personality, and his sense of humor; scores of former students now hold academic, research, and government posts.

I was fortunate to have been one of Dr. Norris' students and studied under him in the late 1980s and early 1990s. I first met him in 1979 while he was studying gray whale mating behavior in the Bahia Magdalena, Mexico aboard the *Regina Maris* — a square-rigger converted for study of whales. I was very new to the field, in fact, I had never seen a marine mammal. It was my first exposure to Dr. Norris, and I knew nothing of him or what he had already accomplished in his illustrious career. At first I was taken aback by his raucous, not-particularly-professorial style, but quickly realized that he was fun and that learning from him would come easy.

One evening after our work was done and before dinner, Dr. Norris sat looking pensively over the gunwale of the ship. From a distance, I watched as he studied a small group of seabirds alongside that paddled to hold station against the incoming tide. He watched the birds dipping and maneuvering amongst themselves. After a few minutes, he jumped up and scurried below to his quarters. I could hear him clacking away — always with that index finger-only style — on his portable typewriter. About 30 minutes later he returned to the deck waving several pages of text and exclaiming, "I've got it! I figured out how schooling and flocking behavior works!"

I looked over the side of the ship and, unlike Dr. Norris, I saw nothing more than a small group of birds. He saw much more, and it was as if they had revealed an important tenet to him. I like to think it was the genesis of one of his theories on marine vertebrate schooling behavior and communication across schools that he would publish much later. However, I understand that, for him, developing such theories had many such geneses and that countless similar revelations had come to him. I marveled then, and many times later, at his ability to see the natural world in insightful ways and the way he could synthesize his observations into coherent theories that made such sense to the rest of us.

Dr. Norris has left us, but his contributions to science live on, as do his efforts to protect the animals he loved and the warmth in the hearts of the countless people he inspired.

Gregory K. Silber is the Office of Protected Resources' Coordinator of Large Whale Recovery Activities. Ken Norris was his doctoral thesis advisor at the University of California at Santa Cruz and served on his Master's thesis committee at the Moss Landing Marine Laboratories.

Protected Resources Profile: Roger Gentry, PhD

The Office of Protected Resources is proud to welcome Dr. Roger Gentry to its team of scientists and resource managers in Silver Spring, Maryland. The distinguished career of Dr. Gentry seems to have evolved alongside the development of the comparatively new field of marine mammal science and investigation. His interest in marine mammals grew out of his fascination for bats and their ability to locate objects through the production of high frequency sound (echolocation). This drew him to pinnipeds (seals and sea lions) in the early years of marine mammal science. Initial scientific inquiries into their potential for echolocation abilities (scientists now know that among marine mammals, this skill is limited to dolphins and other toothed cetaceans). While earning his Master's of Science degree in biology from California State University in San Francisco, he worked at Stanford Research Institute's Biosonar Laboratory focusing on understanding location of sound by pinnipeds underwater. There, he served as research assistant to R. J. Schusterman conducting research on cognition and sensory function in pinnipeds and sea otters. This combination of sound and seals would continue to captivate his attention for the next 30 years, although as is the case of the science in which he is trained, his methods have undergone dramatic change.

After he completed his work at the Biosonar Laboratory, he turned his attention to the behavior and ecology of animals in their natural environment. In working toward his Ph.D., Roger studied Steller sea lion behavior in California and soon afterward observed New Zealand fur seals as part of a post doctoral research. In 1974, at the beginning of his 25-year tenure of service with National Marine Fisheries Service (NMFS), Roger began the St. George Island Project, one of the longest-running pinniped studies to ever be undertaken. This 18-year project was established by the North Pacific Fur Seal Commission to answer questions about the failure of fur seal populations to recover subsequent to their over-exploitation for the fur trade. While working on northern fur seals out of the NMFS National Marine Mammal Laboratory in Seattle, Roger also spent time investigating the lives of numerous other marine mammal species including work on: South African fur seals, Hooker's sea lions, and Ross seals.

It was during his time at St. George that he and his colleagues developed a technique for studying pinnipeds during their feeding trips at sea that revolutionized marine mammal science. In 1976, Roger and Jerry Kooyman published a description of a mechanical time-depth recorder (TDR) that they developed for measuring diving in nursing pinniped mothers. After deploying this instrument on six species of fur seals, they published, in 1987, the first worldwide comparison of pinniped behavior and ecology entitled, "Fur Seals: Maternal Strategies on Land and at Sea." A later electronic version of the TDR was made commercially available and become a standard tool for documenting the foraging and migratory patterns of large marine vertebrates, now including tuna and turtles. The instrument allowed scientists to stop describing one species at a time and start comparing different species or a single species in different habitats. This shift from description to comparison helped the field of marine biology mature, as it would any scientific discipline. The next phase in that maturation is usually experimentation, which Roger began in his next book.

After studying northern fur seals in the Soviet Union in 1990, Roger ended the field phase of his research in 1992 and began writing a book about the data he had collected since 1974. This book, "Behavior and Ecology of the Northern Fur Seal," was published in 1997 and describes the many field experiments he has used to closely examine the behavior of this one species.

This book was a turning point in his career in that it satisfied his interest in studying a problem in ever-smaller increments. After its completion, he decided that the next step was to take a more expansive approach and try to integrate scientific research from different disciplines. At about that time, the Office of Protected Resources decided to expand its staff working on the problem of anthropogenic noise and marine mammals. The Office needed someone who could communicate with the acoustic community, assemble recent research on marine mammal hearing, and help integrate it into a new acoustic policy for NMFS. For Roger, it was a welcome return to his original interests as well as an opportunity to work with old friends, while doing science at a different level. So, after a hurried trip to Monaco where he organized the scientific program for the first World Marine Mammal Conference, he moved from Seattle to Silver Spring.

Roger feels that the framers of the MMPA could not have anticipated that anthropogenic noise in the marine environment would become such a significant threat to marine mammals. He hopes to lead the way to developing acoustic policies that more thoroughly, holistically, and consistently address acoustic threats to marine mammals. One of the first challenges he sees ahead of him is to give clear guidance to those that create noise in the marine environment about what kinds of sounds are likely to harm marine mammals and sea turtles. He recently organized a workshop for the Office of Protected Resources from which participants will eventually produce new Acoustic Criteria for NMFS (see page 7, "Acoustic Workshop Held by NMFS"). He knows that to the outside world, NMFS is seen as a world leader in the move to protect marine creatures from this new, yet pervasive form of ocean pollution. His goal is to turn that perception into a reality.

Memorandum of Agreement Regarding Captive Marine Mammals

When the Marine Mammal Protection Act (MMPA) was amended in April 1994, Congress made substantial changes to many of the MMPA's permit provisions including limiting NMFS' public display authority to the capture of wild marine mammals, the importation of marine mammals not previously held under a permit in the United States, and maintaining the inventory for captive cetaceans and pinnipeds. Although the National Marine Fisheries Service (NMFS) and the Fish and Wildlife Service (FWS) continue to share responsibilities under the MMPA, the amendments eliminated their role in specifying any transport or care and maintenance standards for captive marine mammals held for public display purposes once they have been captured from the wild or imported into the United States. This responsibility now belongs solely to the U.S. Department of Agriculture's Animal and Plant Health Inspection Service (APHIS), which administers the Animal Welfare Act (AWA).

As part of the implementation of the MMPA Amendments of 1994, the Permits Division of the Office of Protected Resources took the lead in redrafting a Memorandum of Agreement (MOA) among NMFS, the FWS, and APHIS under the AWA.

Following three years of negotiations, on July 21, 1998, Rolland A. Schmitten (Assistant Administrator for NMFS), Jamie Clark (FWS), and Dr. Craig Reed (APHIS), signed a revised MOA that outlines the roles of each agency in furthering the purposes of the MMPA and the AWA as they relate to the humane care, handling, treatment and transportation of captive marine mammals, and to the export of marine mammals to foreign facilities.

The revised MOA supersedes the original agreement effected in 1979. The MOA promotes and will facilitate more effective and consistent cooperation among the parties in fulfilling their respective responsibilities, with minimum duplication of efforts. Most of the procedures outlined in the MOA are not new, but represent those that have been developed since the passage of the MMPA Amendments of 1994, in the day-to-day working arrangements of the three agencies.

Copies of the MOA may be obtained by writing to Ann Hochman in the Permits Division of the Office of Protected Resources. Requests must include full name and complete mailing address. Interested parties may also fax their requests to the Permits Division at (301) 713-2289; however, copies of the MOA will be provided via mail only.

Acoustic Workshop Held by NMFS

On September 10-12, 1998, the Office of Protected Resources hosted a workshop on anthropogenic noise in the marine environment and its impacts on marine mammals. This workshop enabled NMFS to bring to the table some of the world's most respected acousticians with experience in marine mammal physiology and behavior and engage in open dialogue on issues critical to making policy decisions about anthropogenic sound in the marine environment.

Recent evidence has lead researchers to conclude that ambient noise levels in the oceans have doubled in the last decade. Although, a portion of this sound comes in the form of weapons testing and seismic surveys, the vast majority is directly attributable to commercial shipping (there is currently no regulatory control over commercial shipping operations although regulations are in place for military and scientific research operations). Some manmade noise levels may have serious impacts on marine mammals including harassment, injury, or even death.

Since the field of acoustics is a rapidly-advancing area of study, NMFS conducted the workshop primarily to gather the best available science in a from experts. This information will be shared with NMFS staff in the regions who are currently developing consistent policies on manmade noise and its effects on marine mammals. Although the MMPA and the Endangered Species Act (ESA) will be the legislative mechanisms by which NMFS will be able to address acoustic issues, these investigations will also address impacts to marine species vital to the lives of marine mammals such as prey species (e.g., herring) with sensitive hearing within the range of many current acoustic sources.

To coordinate its acoustics activities with those of other government agencies, NMFS meets with the Interagency Coordinating Group on Acoustics (IGGA), which is comprised of representatives of NMFS, Army Corps of Engineers, Minerals Management Service, scientific community, the U.S. Navy, conservation organizations, and others to lend their expertise in support much-needed research and policies on manmade noise in the marine environment.

NMFS representatives recognized that much internal coordination is needed to provide consistent and clear guidance to those producing noise that has the potential to negatively impact marine mammals. In carrying out the goals of this program, NMFS has made a firm commitment to supporting specific topics of research so that appropriate policies can be crafted to fit actual threats to marine mammals. One example of such research could to be to devise audiograms (sensitivity curves) to help biologists determine within what frequencies of sound affect large whales.

NMFS hopes to continue to open the lines of communication between acousticians, federal and state resource stewardship agencies, and non-governmental organizations by conducting additional workshops and providing additional opportunities for open communication on this issue.

For additional information about this workshop or NMFS' acoustic programs or policies, please contact Dr. Roger Gentry at (301) 713-2322.

NMFS Hears from Stakeholders

In the spirit of cooperation, stakeholders in marine mammal conservation issues have the opportunity to use the MMPA Bulletin as a forum to express their views about working toward common goals. Guest authors from other government agencies, the fishing industry, or conservation groups may contribute, and letters written to NMFS by constituents may also appear. The views expressed by the guest authors are solely their own and do not necessarily reflect NOAA's postions or policies.

Protecting Marine Mammals From the Growing Problem of Ocean Noise: Opportunities and Problems

by: Peter L. Tyack, PhD

The Marine Mammal Protection Act and the Endangered Species Act were initially passed several decades ago when the greatest threats to marine mammals involved whalers intentionally hunting individual animals or fishers setting nets around dolphins to catch tuna. Regulations to protect animals from these threats prohibited humans from "taking" or killing them. Marine mammals now face growing unintentional threats when their habitat is degraded by chemical and noise pollution or loss of food resources. These indirect effects can threaten animal populations by reducing rates of growth or reproduction even when they do not kill or injure animals from acute exposure.

I am a biologist whose primary research interests focus on acoustic communication and social behavior in marine mammals. I am personally concerned that manmade ocean noise may disrupt the behavior and communication of marine animals. I believe that addressing the impacts of ocean noise on marine mammals requires a shift of focus from earlier regulations to protect marine mammals, which were focused on individual takes, to a new emphasis setting priorities based on cumulative impacts to habitats. The ecosystem- or habitat-level approach is the correct one in my opinion for managing the cumulative and long-term impacts of manmade noise upon marine animals. Protecting marine animals from these threats will demand a new habitat-focused regulatory structure to minimize the cumulative risks from all activities rather than focusing exclusively on intentional "takes" of individual animals.

The current regulatory approach relies upon estimating the number of marine mammals or endangered species that may be injured or "taken by harassment" by individual sound sources. Rather than making a judgment about whether behavioral disruption causes harm, harassment often is defined as any detectable change in behavior. While the regulations may appear conservative, they are applied to a tiny minority of sources of ocean noise, particularly those used by scientific researchers, the oil industry, or military sources. The prohibition on taking marine mammals by harassment is seldom enforced, and the regulations are basically only applied to applicants who request permission for a take. For example, research has shown that every time a large ship goes in or out of a U.S. harbor, it is likely to cause changes in the behavior of marine mammals.

If I want to conduct a playback experiment to evaluate this impact, I need to apply for a permit, but the hundreds of ships operate with no regulation at all. It is a bureaucrat's dream only to have to deal with people who ask for permission, but the current combination of restrictive rules that are capriciously applied and seldom enforced, does not serve the cause of marine mammal conservation. The basic problem with low frequency noise and marine mammals is that humans are introducing an ever-growing number of ever-louder noise sources in the sea. There is no effective regulation to protect marine animals from noise pollution, and even if there were, we do not know what levels of sound exposure are safe. The economic and technical forces for increasing manmade noise in the sea are so powerful, and our ignorance of the impacts of sound are so great that it has been nearly impossible to find a balance between precautionary protection and minimizing unnecessary regulation of seafaring humans. As the National Academy of Sciences Committee on Low-Frequency Sound and Marine Mammals pointed out in 1994 the effect of loud low frequency sound could conceivably range between potential hearing loss damage and gradual deafness for the entire species and eventual extinction or practically no discernible impact. This uncertainty created an urgent need for research on what kinds of acoustic exposure pose a risk of hearing loss and behavioral disruption.

In the nearly five years since the National Academy report, there have been important new studies that define the relationship between acoustic exposure and both hearing damage and behavioral disruption. For the first time, we have data for dolphins and seals indicating what kinds of exposure to underwater sound cause changes in hearing sensitivity (thought to be a signpost of potential for hearing damage). While such data are not available for baleen whales, there has been an ambitious series of playback experiments evaluating behavioral responses of baleen whales to experimental exposure to loud, low frequency sound. I believe that the best way to protect animals from the adverse impact of ocean noise is to establish exposure guidelines based upon this kind of research. No individual experiment can define what exposures are safe, and further research will be essential to fine tune policy, but we are finally reaching a point where there may be enough data from enough studies to start defining a reasonable policy based upon the science.

We now have a better opportunity than ever before to develop effective measures to protect marine life from noise pollution. The federal government has recently formed an Interagency Coordinating Group on Acoustics in order to gather data and develop policy on this issue. The National Marine Fisheries Service recently held a workshop on acoustic criteria (see page 7, "Acoustic Workshop Held by NMFS") and is in the process of establishing new guidelines for noise exposure to marine mammals. In addition to regulating individual sources of noise, it will be critical to direct regulatory attention to critical marine mammal habitats where there are particularly high levels of manmade noise. Regulatory agencies must set priorities by finding areas that vulnerable marine mammals rely upon and that exceed noise exposure guidelines. The combination of mapping the distribution and population status of marine mammals, mapping manmade noise, and applying guidelines for safe exposure of noise is critical for defining the problem areas where we must protect marine mammals from adverse impacts of manmade noise.

Dr. Peter Tyack is an Associate Scientist in the Biology Department of the Woods Hole Oceanographic Institution. He was a member of the Committee on Low Frequency Sound and Marine Mammals of Ocean Studies Board, National Academy of Sciences, and has been involved in several large research projects on the behavioral effects of loud low frequency sound on baleen whales. Dr. Tyack can be reached at ptyack@whoi.edu.

Whale-Watching Ethics Forum Scheduled for January 6

The Center for Coastal Studies and the Stellwagen Bank National Marine Sanctuary are co-sponsoring a forum to examine the existing guidelines that protect whales in the northeast from whale watchers. The meeting, "Whale-Watching Ethics, A Coastal Solutions Initiative Forum," will examine current activities and future trends in light of the existing whale-watching guidelines (established by the Northeast Regional Office of the National Marine Fisheries Service) and will discuss improvements that may be needed to insure that the highest standards possible are set to protect the whales while allowing whale watching to continue. Specific topics to be covered during the forum include New England whale-watching guidelines, industry perspectives, whale-watching trends, beyond the guidelines, research and rules of the road.

Motivations for the forum include two recent collisions with whales by whale-watching boats (a humpback in August and a minke in September), calls for additional regulations by conservation organizations including the Center for Marine Conservation and GreenWorld, rapidly-increasing use of commercial and recreational whale watchers in the northeast. Whale protective measures, including the possible need for additional regulation, will also be addressed in revisions to the management plan for Stellwagen Bank National Marine Sanctuary.

For further information and to register for the forum, contact Joanne Jarzobski at the Center for Coastal Studies at (508) 487-2038; e-mail: solution@coastalstudies.org. This article was reprinted, with permission, from the November 1998 issue of "Right Whale News."

Video about Reducing Entanglements Available from Maine/NH Sea Grant

A new video, "Whales and Fishermen: A Plan for Reducing Entanglements," seeks to enlist fishermen in the plan to reduce the incidental take of large whales in fishing gear. The 11-minute video includes footage of the four large whales frequently seen in the Gulf of Maine: humpback, fin, minke and right whales. Saying "you are the eyes of the ocean," the video asks fishermen to help scientists collect accurate information about entangled whales. Field identification characters for the four species are provided, along with instructions about what to do when encountering an entangled whale. Some information is also provided on interim gear regulations and efforts to find out what works and what doesn't, again encouraging fishermen to participate. Supplementing the video are two flyers, "Marine mammals & commercial fisheries: Understanding incidental take reduction efforts" and "Whale sightings and science: how you can help." The video was produced by the Maine/New Hampshire Sea Grant College Program and the Department of Public Affairs of the University of Maine. Funding was provided by the National Marine Fisheries Service, the Center for Coastal Studies and the New England Aquarium.

Copies of the video and flyers can be obtained for $15.00 from Sea Grant Extension, University of Maine, 5715 Coburn Hall, #22, Orono, ME 04469-5715; (207) 581-1440. This article was reprinted, with permission, from the November 1998 issue of "Right Whale News."

National Marine Fisheries Service
Office of Protected Resources
1315 East-West Highway
Silver Spring, MD 20910

First-Class Mail
Postage & Fees Paid
NOAA
Permit No. G-19

From the Editors...

The Office of Protected Resources officially joined the "information age" only four short years ago when it posted its first internet site on the World Wide Web. Since then, there have been astounding advances in technology around the world. To keep up with the times, NMFS has been making some technological advances of its own.

For the last year or so, the Office of Protected Resource's web team has been working on improving the Office's overall web site design. The web site is still under extensive construction, but has undergone many significant changes including the inclusion of the "Electronic Reading Room" filled with NMFS publications in portable document format (PDF) for easy downloading and printing (including back issues of the *MMPA Bulletin*).

www.nmfs.gov/prot_res

Numerous photographs of marine mammals have also been included for overall site enhancement as well as to aid in visitors' identification of marine mammal species described therein. Although the Office's web site has been popular with the public since its inception, the recent improvements have rekindled interest in the site and, in turn, in NMFS' protected species programs. Currently, the Office of Protected Resource's web site is consistently rating in the top six of the most often "hit" or viewed web sites out of all NMFS web sites, with approximately 200 visitors a day.

Future plans for the site include adding a search engine along with additional links to protected species-related sites, and updated information on NMFS marine mammal and other protected species recovery activities and policies.

The web site is another way for the Office of Protected Resources to reach its constituents with information about its programs and policies. We encourage you to visit the site and let us know what you think about the recent changes. If you have any suggestions or comments you might have about how the Office of Protected Resource's web site can better serve you, please contact the web site editor at: **prwebmaster@noaa.gov**.

As always, the *MMPA Bulletin* Editorial Team appreciates your support.

Publications Available from the Office of Protected Resources

If you would like to receive any of the publications listed below, please mark the appropriate circles, cut this page along the vertical dotted line and mail it to the Office of Protected Resources, Attn. MMPA Bulletin. Please allow 4-6 weeks for delivery. **Remember, many of these documents can be easily accessed at the NMFS Office of Protected Resources web site on the World Wide Web in PDF (www.nmfs.gov/prot_res).**

(cut here)

- ○ The Marine Mammal Protection Act of 1972 As Amended (February 1995)

Marine Mammal Protection Act of 1972 Annual Report to Congress

- ○ January 1, 1997 - December 31, 1997 **NEW!!!**
- ○ January 1, 1995 - December 31, 1995 (sorry, out of print)
- ○ January 1, 1992 - December 31, 1993
- ○ January 1, 1996 - December 31, 1996
- ○ January 1, 1994 - December 31, 1994
- ○ January 1, 1990 - December 31, 1991

Office of Protected Resources Technical Memorandum Series:

- ○ Differentiating Serious and Non-Serious Injury of Marine Mammals Taken Incidental to Commercial Fishing Operations: Report of the Serious Injury Workshop 1-2 April 1997, Silver Spring, Maryland. NMFS-OPR-13, 48 p. (January 1998)
- ○ Guidelines for Assessing Marine Mammal Stocks: Report of the GAMMS Workshop April 3-5, 1996, Seattle, Washington. NMFS-OPR-12, 93 p. (February 1997)
- ○ Report of the Workshop to Assess Research and Other Needs and Opportunities Related to Humpback Whale Management in the Hawaiian Islands. NMFS-OPR-11, 134 p. (February 1997)
- ○ National Contingency Plan for Response to Unusual Marine Mammal Mortality Events. NMFS-OPR-9, 118 p. (September 1996)
- ○ Rescue, Rehabilitation, and Release of Marine Mammals: An Analysis of Current Views and Practices. NMFS-OPR-8, 65 p. (July 1996)
- ○ Coastal Stock(s) of Atlantic Bottlenose Dolphin: Status Review and Management. NMFS-OPR-4, 120 p. (October 1994)
- ○ Pinniped Forensic, Necropsy, and Tissue Collection Guide. NMFS-OPR-3, 80 p. (August 1994)
- ○ Marine Mammal Health and Stranding Response Program: Program Development Plan. NMFS-OPR-2, 35 p. (July 1994)
- ○ NMFS Observer Programs: Minutes and Recommendations of a Workshop Held in Galveston, TX Nov. 10-11, 1993. NMFS-OPR-1, 96 p. (July 1994)

Reports and Other Office Publications:

- ○ Quantitative Behavioral Study of Bottlenose Dolphins in Swim-With-The Dolphin Programs in the United States. (April 1994)
- ○ Report to Congress on Results of Feeding Wild Dolphins: 1989-1994. (July 1994)
- ○ Marine Mammal Strandings in the United States. Proceedings of the Second Marine Mammal Stranding Workshop, Miami, FL. December 3-5, 1987. U.S. Dep. Commer., NOAA. (January 1991)

ESA Reports/Recovery Plans:

- ○ Recovery Plan for the Blue Whale, *Balaenoptera musculus*. (July 1998) **NEW!!!!**
- ○ Endangered Species Act Biennial Report to Congress: Status of Recovery Programs July, 1994 - September, 1996. (March 1997)
- ○ Recovery Plan for the Steller Sea Lion, *Eumetopias jubatus*. (December 1992)
- ○ Final Recovery Plan for the Northern Right Whale, *Eubalaena glacialis*. (December 1991)
- ○ Recovery Plan for the Hawaiian Monk Seal, *Monachus schauinslandi*. (March 1983)

MMPA Bulletin

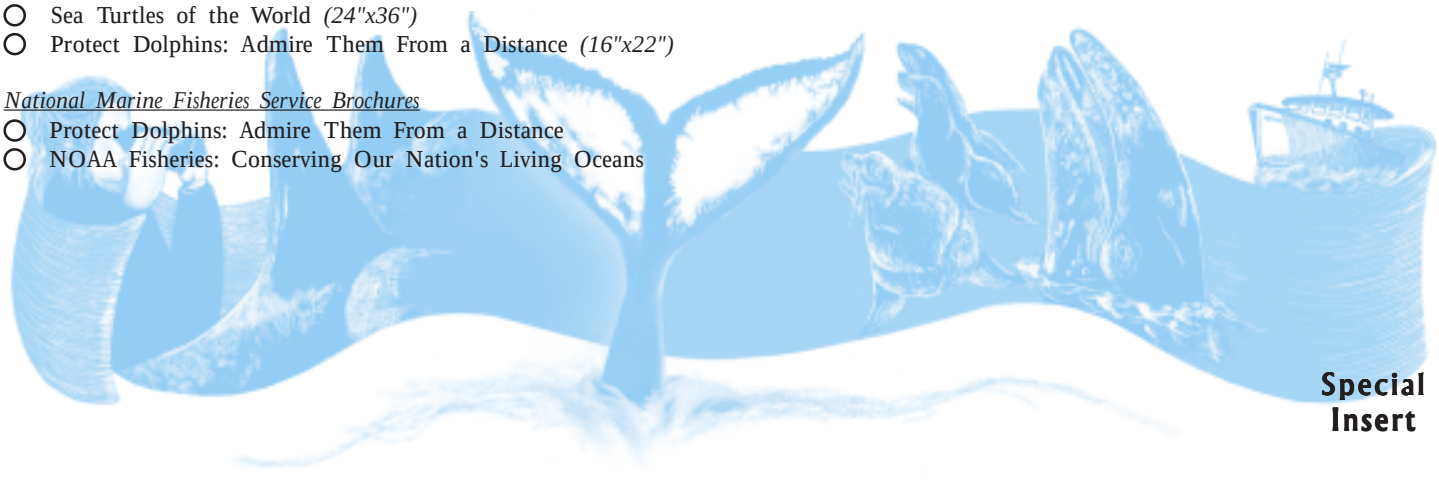
- ○ 3rd Quarter 1998 **NEW!!!!**
- ○ 2nd Quarter 1998
- ○ 1st Quarter 1998
- ○ September/October, 1996
- ○ May/June, 1996
- ○ January/February, 1996
- ○ September/October, 1995
- ○ June/July, 1995
- ○ April/May, 1995
- ○ February, 1995
- ○ November, 1994
- ○ September, 1994

National Marine Fisheries Service Posters

- ○ Marine Mammals of the Western Hemisphere *(24"x36")*
- ○ Sea Turtles of the World *(24"x36")*
- ○ Protect Dolphins: Admire Them From a Distance *(16"x22")*

National Marine Fisheries Service Brochures

- ○ Protect Dolphins: Admire Them From a Distance
- ○ NOAA Fisheries: Conserving Our Nation's Living Oceans



Special Insert

NMFS & NOS Join the "National Watchable Wildlife Program"

The National Watchable Wildlife Program (NWWP) is a unique partnership between federal, state and environmental groups that have been promoting safe and responsible wildlife viewing guidelines for the past ten years. Organizations that have signed the NWWP Memorandum of Understanding include the U.S. Fish and Wildlife Service, the U.S. Forest Service, the National Park Service, Audubon Society, Defenders of Wildlife, National Wildlife Federation, and other wildlife interest groups. The NWWP produces various public education and outreach materials to teach people how to responsibly and respectfully view wildlife, including an informative state guidebook series that highlights places to view wildlife while educating the public as to why it is harmful to closely approach, disturb, and feed wild animals. The NWWP has developed guidelines on how to view wildlife to help protect the safety and well-being of both wild animals and people.

Some examples of the "Golden Rules of Watching Wildlife" that can be found in the guidebook Watching Wildlife by Mark Damian Duda (1995, Falcon Press) include: view wildlife from a safe distance and use binoculars for a "close look"; stay clear of nests, dens and rookeries; and never touch or feed wild animals. To date, over twenty state guidebooks have been completed and several more are in production. In addition, the Center for Wildlife Information (CWI) in Missoula, Montana works closely with NWWP member organizations who are CWI "Partners in Wildlife Stewardship." CWI produces complimentary education and outreach materials such as the "Wildlife Stewardship" brochure and poster series that provides information on how to safely view and photograph wildlife.

Although the NWWP has focused primarily on terrestrial species of wildlife, the NWWP's viewing etiquette and wildlife stewardship principles directly apply to marine species as well. This summer, both the National Marine Fisheries Service (NMFS) and the National Ocean Service (NOS) were accepted by the NWWP as "Supporters" of the program. NMFS and NOS participation will help broaden the NWWP to focus efforts on marine species, and will be an opportunity to enhance NOAA's education and outreach efforts to teach the public how to conduct themselves responsibly in the marine environment. The NWWP will complement our current efforts to combat the persistent problems of the public: (1) closely approaching, feeding and disturbing marine mammals, sea turtles, sea birds and fish; and (2) engaging in harmful boating and diving/snorkeling practices that damage coral reef, sea grass, and other marine resources. The NWWP will also help put NOAA in a leadership role with other organizations in teaching the public about responsible marine wildlife watching. In October, NMFS and NOS delivered a joint presentation at the 1998 NWWP conference in Albuquerque, New Mexico that explained the need to apply the NWWP viewing guidelines and stewardship principles to marine species, and ways to meet that objective. NMFS and NOS also participated in the conference's Wildlife Expo by displaying an exhibit booth and handing out education and outreach materials about marine mammals, endangered marine species and NOAA's diverse programs.

Several of NOS' National Esturine Research Reserves sites have already been working with the NWWP for several years. The fact that NMFS and NOS have now formally joined the NWWP (collectively on behalf of NOAA), will help ensure that the wildlife stewardship principles are incorporated throughout the various elements of NOAA. There are many opportunities for NOS' National Marine Sanctuaries and NMFS' Regional Offices to incorporate the NWWP message into current outreach programs. NMFS and NOS have already contributed to the upcoming NWWP guidebook for the Virgin Islands and Puerto Rico, and the National Marine Sanctuaries has developed a "Sea Smart-See Smart" campaign consistent with the NWWP. Plans are currently underway for a overview guidebook focusing on how to safely and responsibly view all species of marine wildlife from whales to corals. The 1999 annual NWWP conference will be held in Ft. Myers, Florida, which will provide an opportunity for NMFS and NOS to highlight marine species and habitats.

For more information about NOAA's role in the National Watchable Wildlife Program, you can contact Trevor Spradlin at the NMFS Office of Protected Resources at (301) 713-2289 x103, or Brady Phillips at the NOS National Marine Sanctuary Program at (301) 713-3141 x169.

You can also visit the NWWP website at: http://www.gorp.com/wwldlife/wwhome.htm. The Center for Wildlife Information can be reached at P.O.Box 8289, Missoula, MT 59807 and http://www.marsweb.com/~rattlesnake/